



Title : Market Management System.

Course : Introduction to database.

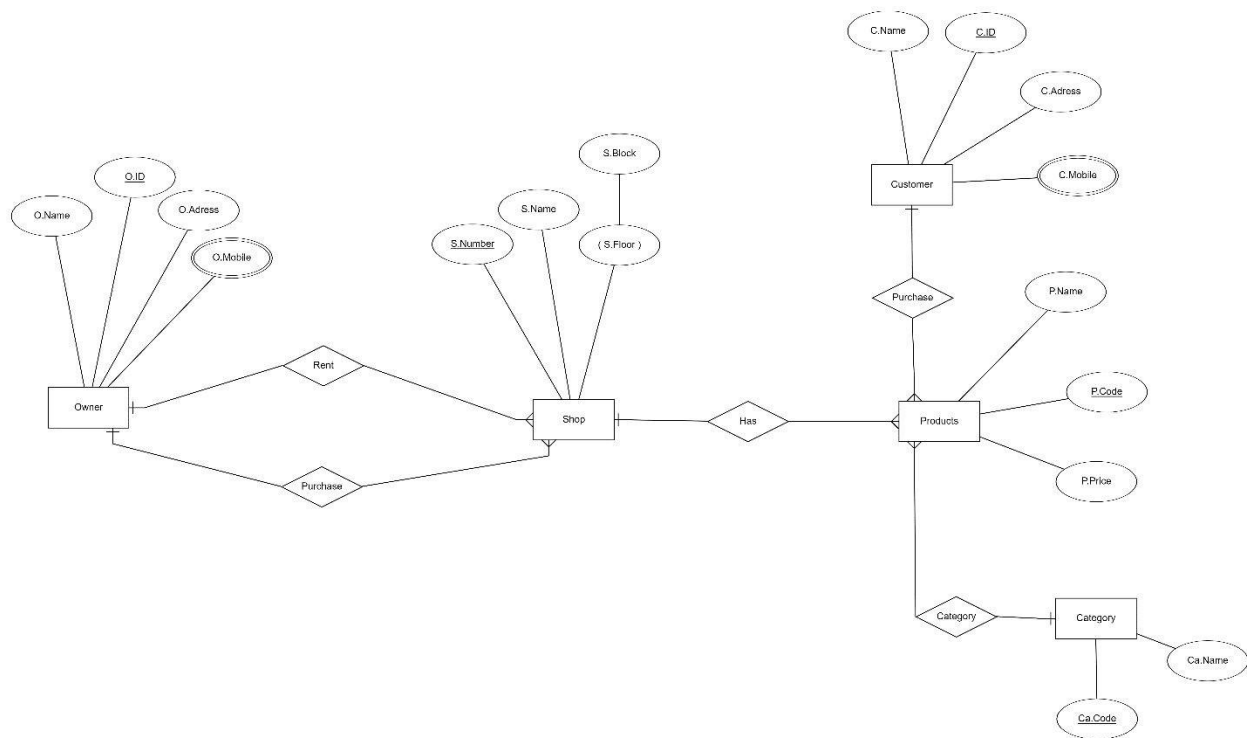
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**ER Diagram Scenario for Market management system :** There are many shops in a market. Each shop has an owner. An owner can rent have many shops. One owner can also purchase many shops. An owner is identified by unique id, name, address and mobile number. An owner can have multiple mobile number. Shop is identified by unique shop number, name and level. Level is composed by block. A shop has many products. Product is identified by unique code, name and price. Products are purchase by customer. One customer may purchase many products. Customer is identified by unique customer id, name, address, phone number. A customer can have multiple phone number. One product belongs to many category and for a category there can be many products. Each category has a name and unique category code.



## **Normalization:**

### **Rent & Purchase:**

**UNF:** O.ID, O.Name, O.Address, O.Mobile, S.Number, S.Name, S.Block.

#### **1NF:**

Here O.Mobile is the multivalued attribute.

O.ID, O.Mobile, S.Name, O.Name, O.Address, S.Number, S.Block.

#### **2NF:**

**1<sup>st</sup>:** O.ID, O.Address, O.Name, O.Mobile.

**2<sup>nd</sup>:** S.Number, S.Name, S.Block

#### **3NF:**

**1<sup>st</sup>:** O.ID, O.Name, O\_H.Number, S.Number.

**2<sup>nd</sup> :** O\_H.Number, O.Address.

**3<sup>nd</sup> :** O.ID, O.Mobile.

**4<sup>rd</sup>:** S.Number, S.Name, S.Block.

**5<sup>th</sup>:** O.ID, S.name.

### **Purchase:**

**UNF:** C.ID, C.Name, C.Address, C.Mobile, P.Code, P.Name, P.Price.

#### **1NF:**

Here C.Mobile is the multivalued attribute.

C.ID, C.Mobile, P.Code, C.Name, C.Address, P.Name, P.Price.

#### **2NF:**

**1<sup>st</sup>:** C.ID, C.Name, C.Address, C.Mobile.

**2<sup>nd</sup>:** P.Code, P.Name, P.Price.

#### **3NF:**

**1<sup>st</sup>:** C.ID, C.Name, C\_H.Number.

**2<sup>nd</sup>:** C\_H.Number, C.Address.

3<sup>rd</sup>: C.ID, C.Mobile.

4<sup>rd</sup>: P.Code, P.Name, P.Serial.

5<sup>th</sup>: P.Serial, P.Price.

6<sup>th</sup>: P.Code, C.ID.

#### Category:

UNF: P.Code, P.Name, P.Price, Ca.Code, Ca.Name.

1NF: No multivalued attribute. So this is already in 1NF.

P.Code, P.Name, P.Price, Ca.Code, Ca.Name.

#### 2NF:

1<sup>st</sup>: P.Code, P.Name, P.Price, 2

<sup>nd</sup>: Ca.Code, Ca.Name.

#### 3NF:

1<sup>st</sup>: P.Code, P.Name. P.Code.

2<sup>nd</sup>: P.Code, P.Price.

3<sup>th</sup>: Ca.Code, Ca.Name.

4<sup>rd</sup>: P.Code, Ca.Code.

#### Has:

UNF: S.Number, S.Name, S.Block, P.Code, P.Name, P.Price.

1NF: No multivalued attribute. So this is already in 1NF.

S.Number, S.Name, S.Block, P.Code, P.Name, P.Price.

#### 2NF:

1<sup>st</sup>: S.Number, S.Name, S.Block.

2<sup>nd</sup>: P.Code, P.Price, P.Name.

#### 3NF:

1<sup>st</sup>: S.Number, S.Name, S.Block.

2<sup>rd</sup>: P.Code, P.Name, S.Number.

3<sup>th</sup>: P.Code, P.Price.

**Final Table:**

1<sup>st</sup>: O.ID, O.Name, O\_H.Number, S.Number.

2<sup>nd</sup> : H.Number, O.Address.

3<sup>nd</sup> : O.ID, O.Mobile.

4<sup>rd</sup>: S.Number, S.Name, S.Block.

5<sup>st</sup>: C.ID, C.Name, C\_H.Number, P.code

6<sup>nd</sup>: C H.Number, C.Address.

7<sup>nd</sup>: C.ID, C.Mobile.

8<sup>rd</sup>: P.Code, P.Name, , S.Number., Ca.Code.

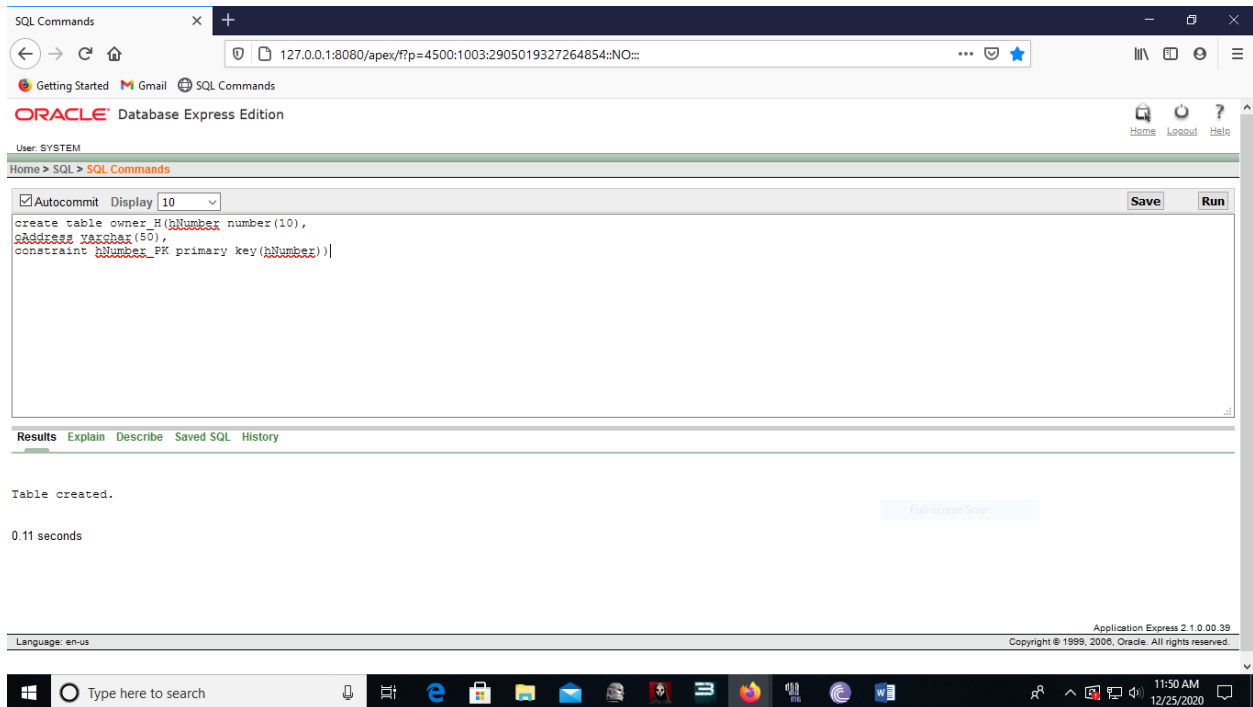
9<sup>nd</sup>: P.Code, P.Price.

10<sup>th</sup>: Ca.Code, Ca.Name.

## Normal Tables:

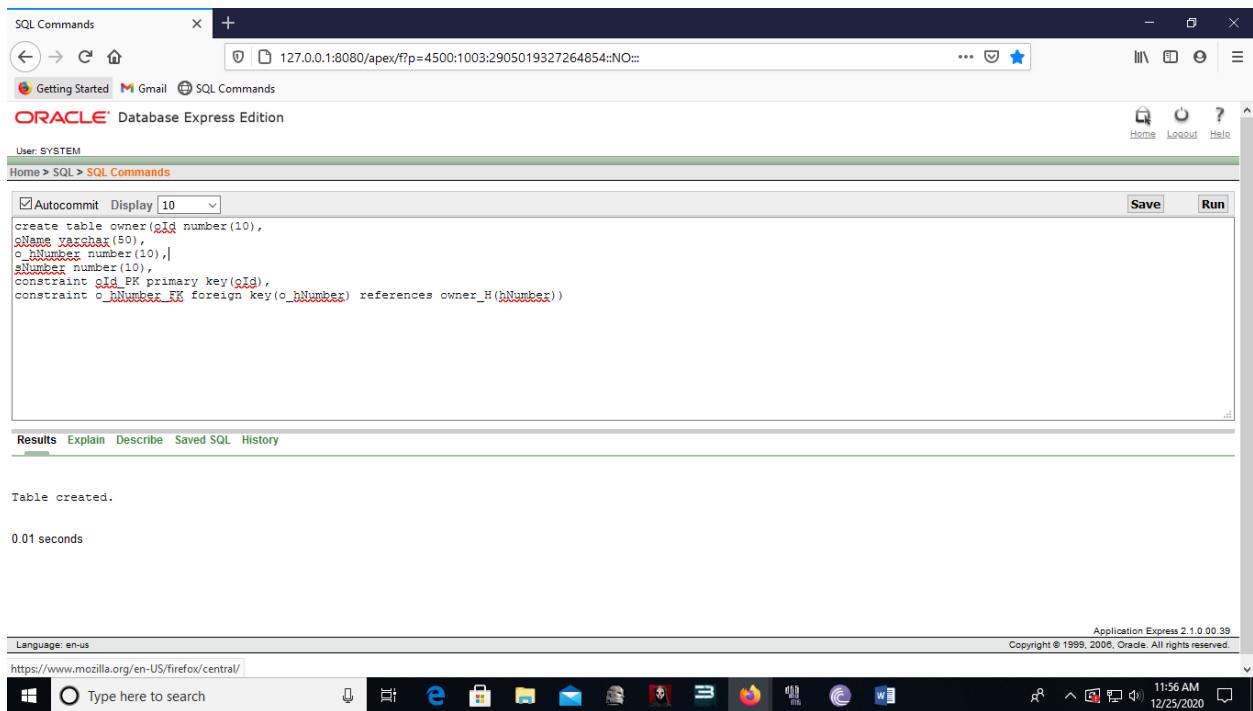
(1)

```
create table owner_H(hNumber number(10),  
oAddress varchar(50),  
constraint hNumber_PK primary key(hNumber))
```



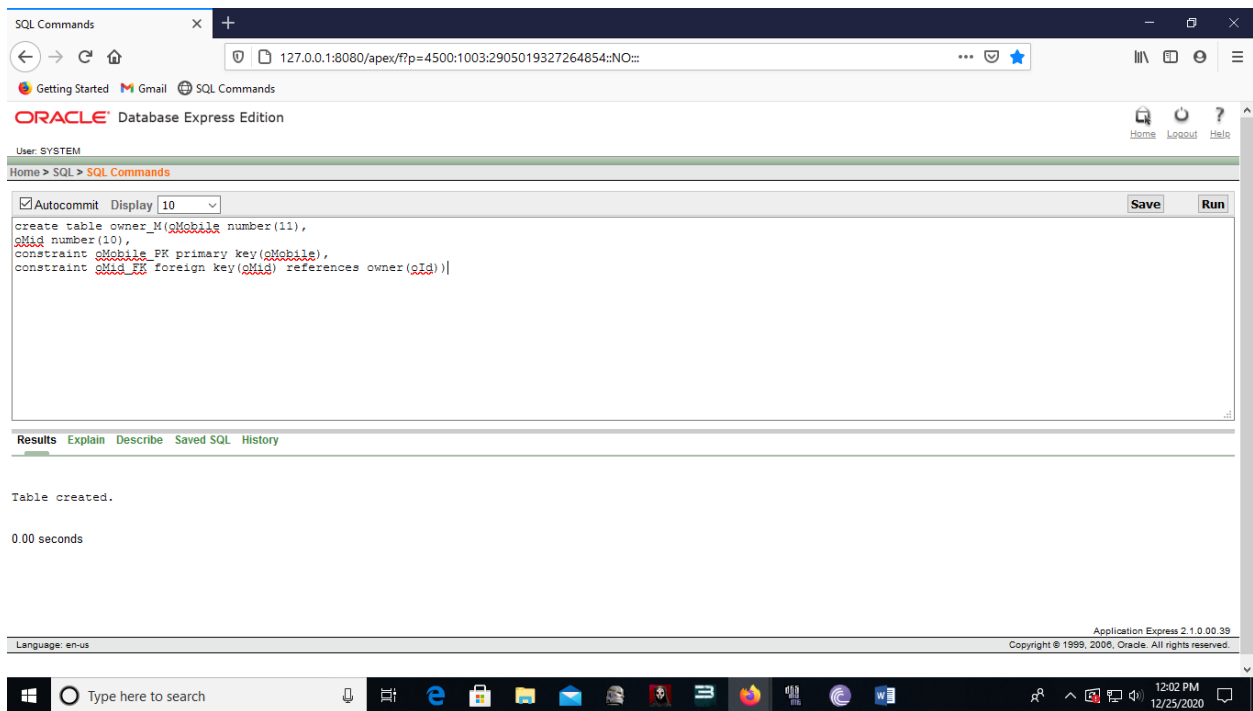
(2)

```
create table owner(old number(10),  
oName varchar(50),  
o_hNumber number(10),  
sNumber number(10),  
constraint old_PK primary key(old),  
constraint o_hNumber_FK foreign key(o_hNumber) references owner_H(hNumber))
```



(3)

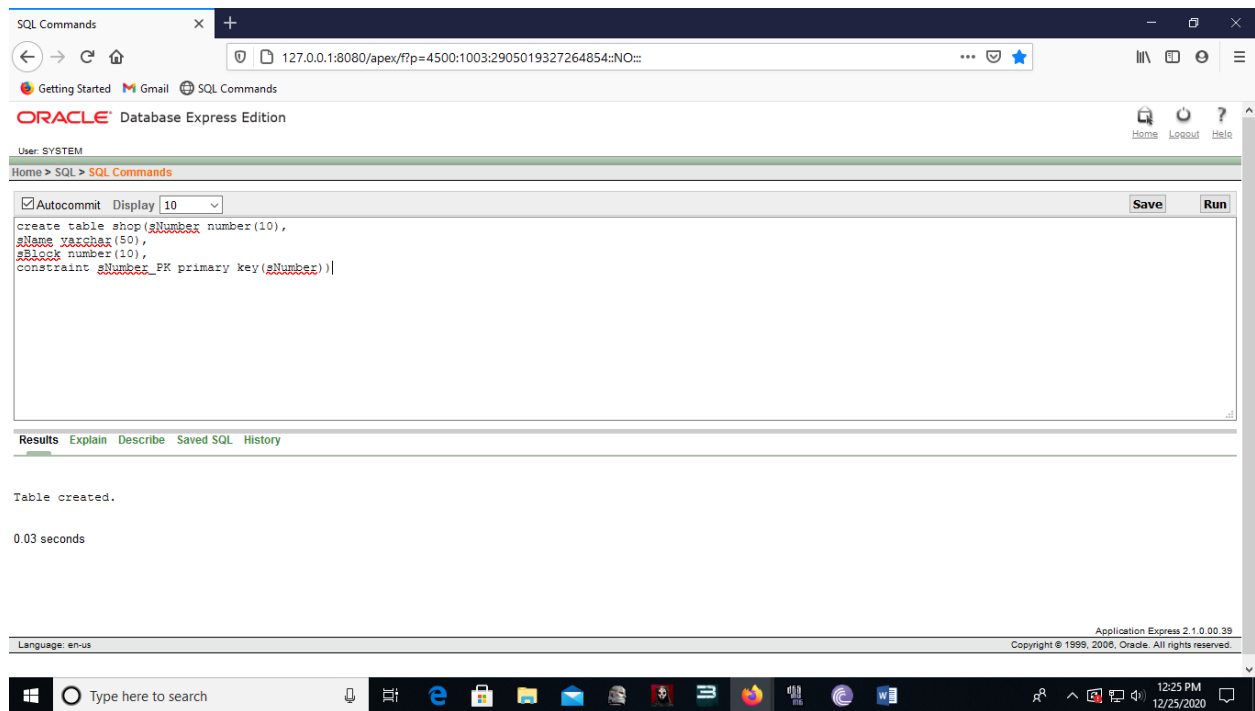
```
create table owner_M(oMobile number(11),  
oMid number(10),  
constraint oMobile_PK primary key(oMobile),  
constraint oMid_FK foreign key(oMid) references owner(old))
```



(4)

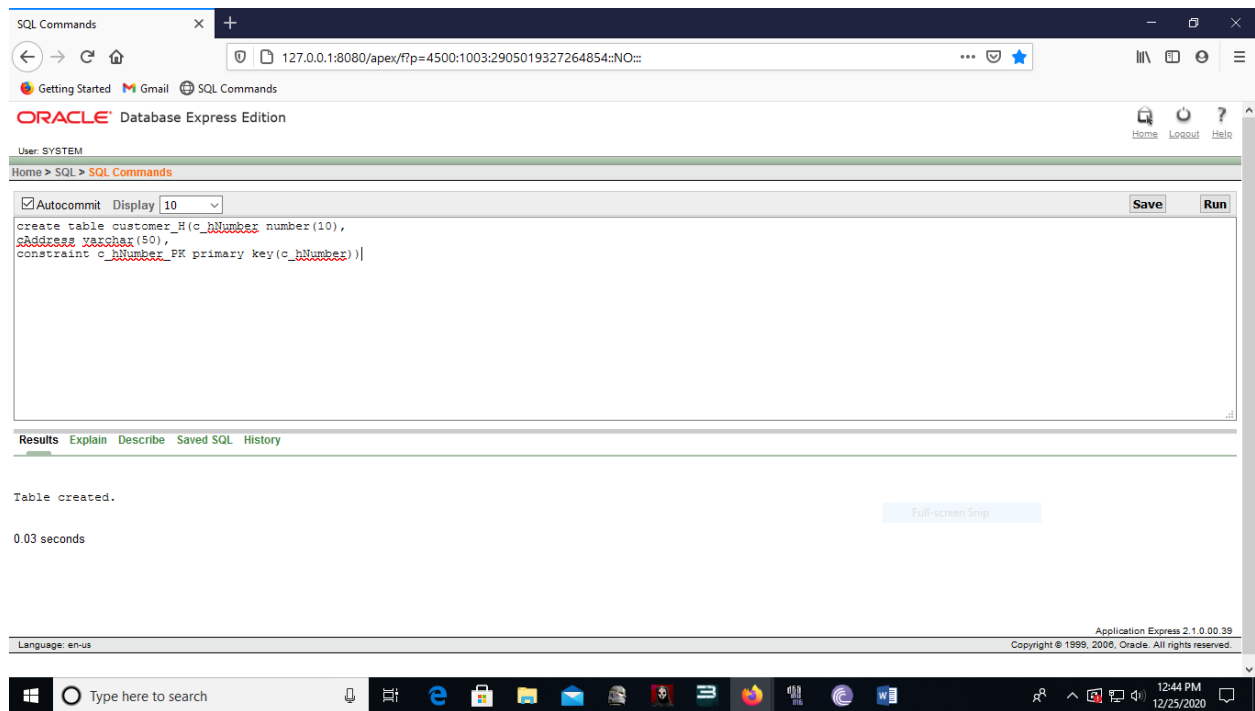
```
create table shop(sNumber number(10),  
sName varchar(50),  
sBlock number(10),  
constraint sNumber_PK primary key(sNumber))
```





(5)

```
create table customer_H(c_hNumber number(10),  
cAddress varchar(50),  
constraint c_hNumber_PK primary key(c_hNumber))
```



(6)

```
create table customer(cld number(10),  
cName varchar(50),  
cc_hNumber number(10),  
constraint cld_PK primary key(cld),  
constraint cc_hNumber_FK foreign key(cc_hNumber) references customer_H(c_hNumber))
```

SQL Commands

127.0.0.1:8080/apex/f?p=4500:1003:2905019327264854::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
create table customer(cId number(10),
cName varchar(50),
cc_hNumber number(10),
constraint cId_PK primary key(cId),
constraint cc_hNumber_FK foreign key(cc_hNumber) references customer_H(c_hNumber))
```

Results Explain Describe Saved SQL History

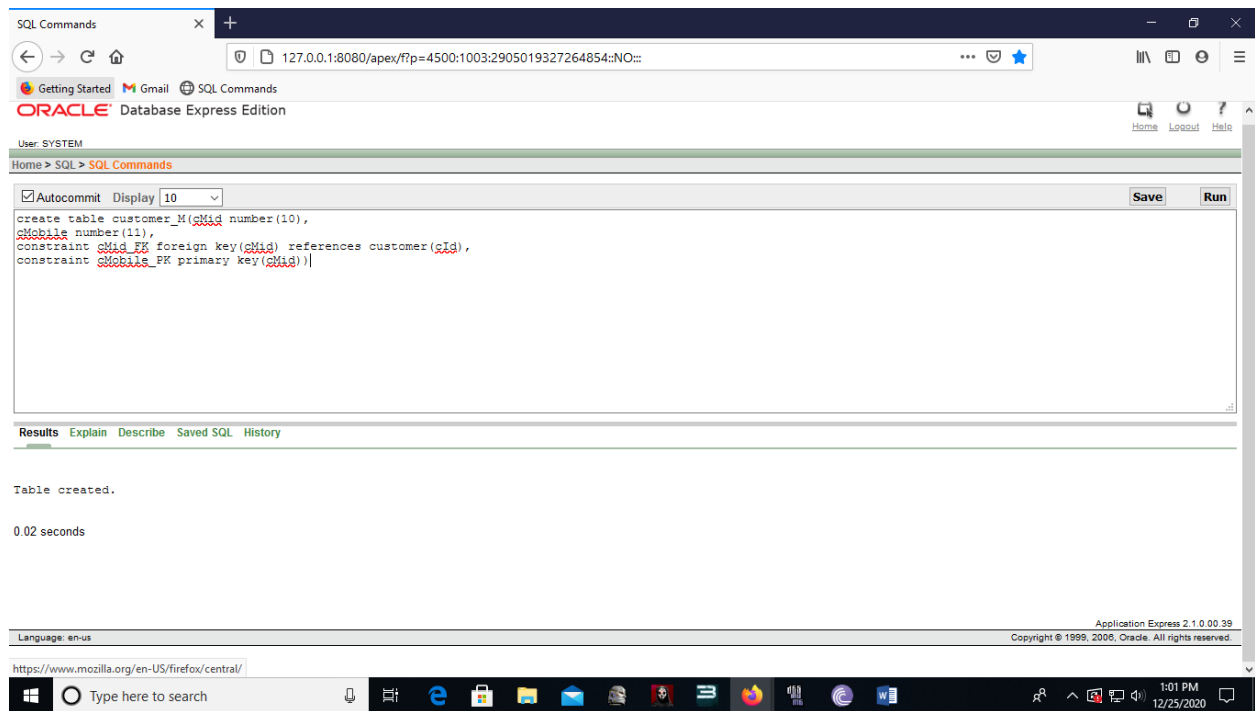
Table created.

0.02 seconds

Language: en-us Application Express 2.1.0.00.39 Copyright © 1999, 2005, Oracle. All rights reserved.

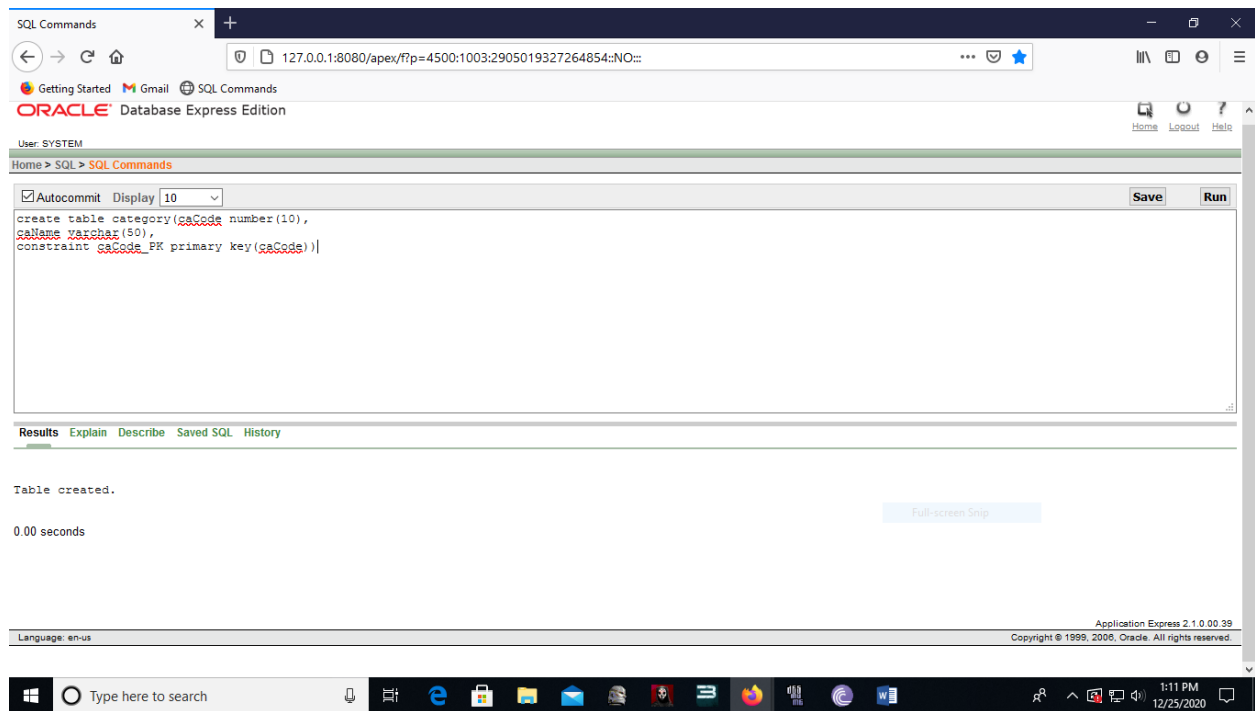
(7)

```
create table customer_M(cMid number(10),
cMobile number(11),
constraint cMid_FK foreign key(cMid) references customer(cId),
constraint cMobile_PK primary key(cMid))
```



(8)

```
create table category(caCode number(10),
caName varchar(50),
constraint caCode_PK primary key(caCode))
```



(9)

```
create table product(pCode number(10),  
pName varchar(50),  
p_caCode number(10),  
constraint pCode_PK primary key(pCode),  
constraint p_caCode foreign key(p_caCode) references category(caCode))
```

SQL Commands

Food categori for burger and ...

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
create table product (pCode number(10),
pName varchar2(50),
pPrice number(10),
p_catCode number(10),
constraint pCode_FK primary key(pCode),
constraint p_catCode foreign key(p_catCode) references category(catCode));
```

Results Explain Describe Saved SQL History

Table created.

0.00 seconds

Full-screen Snip

Application Express 2.1.0.0.39

Language: en-us Copyright © 1999, 2005, Oracle. All rights reserved.

Type here to search

8:19 PM 12/23/2020

(10)

```
create table product_S(s_pCode number(10),
pPrice number(10),
constraint s_pCode_FK foreign key(s_pCode) references product(pCode))
```

SQL Commands

Food categori for burger and s

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
create table product_s(s_pCode number(10),
pPrice number(10),
constraint s_pCode_FK foreign key(s_pCode) references product(pCode))
```

Results Explain Describe Saved SQL History

Table created.

0.00 seconds

Full-screen Snip

Application Express 2.1.0.0.39

Language: en-us Copyright © 1999, 2005, Oracle. All rights reserved.

Type here to search

8:20 PM 12/25/2020

(11)

create table product\_priceLimit(pLow number(10),  
pHigher number(10))

SQL Commands

Food categori for burger and s

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
create table product_priceLimit(pLow number(10),
pHigher number(10))
```

Results Explain Describe Saved SQL History

Table created.

0.00 seconds

Application Express 2.1.0.0.39

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Type here to search

8:21 PM 12/25/2020

### Alter Table:

alter table customer

add c\_pCode number(10);

The screenshot shows the Oracle Database Express Edition interface. The browser address bar displays the URL `127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::`. The page title is "ORACLE Database Express Edition". The user is logged in as "SYSTEM". The "SQL Commands" window is active, showing the following SQL statement:

```
alter table customer  
add c_pCode number(10);
```

The "Autocommit" checkbox is checked, and the "Display" dropdown is set to "10". The "Save" and "Run" buttons are visible. Below the SQL editor, the "Results" tab is selected, showing the output:

```
Table altered.  
  
0.09 seconds
```

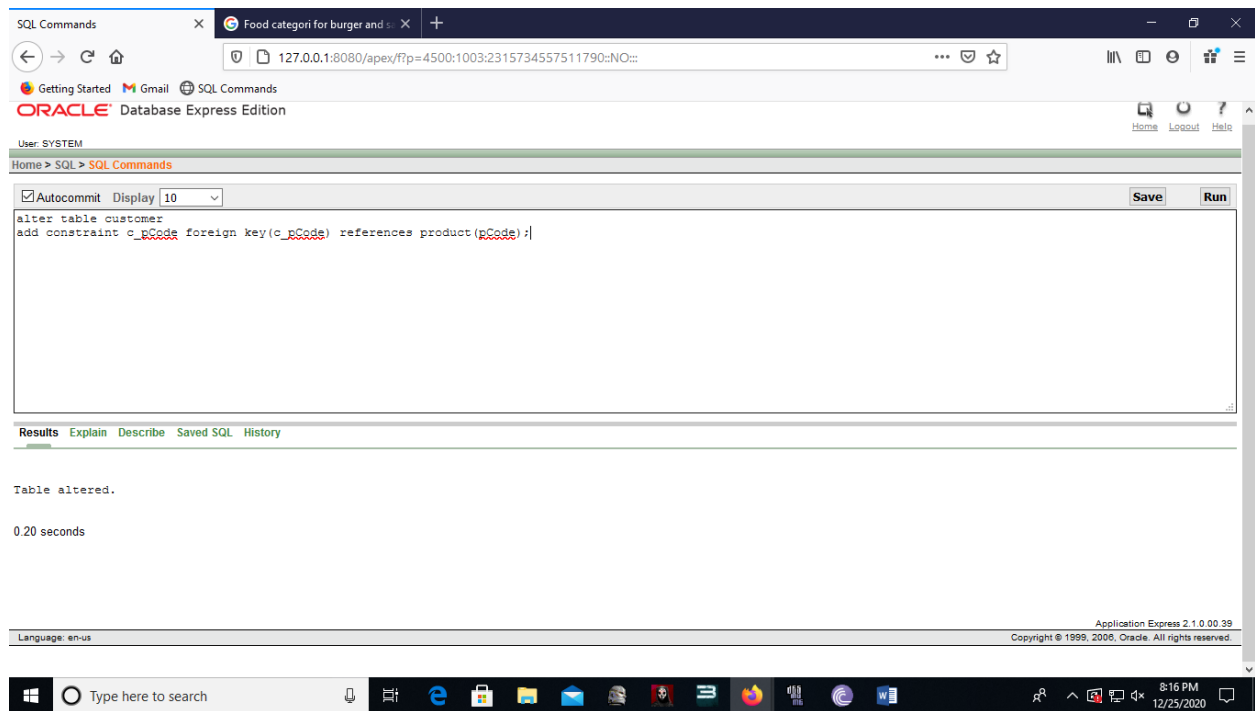
The footer of the application indicates "Application Express 2.1.0.0.39" and "Copyright © 1999, 2009, Oracle. All rights reserved." The Windows taskbar at the bottom shows the time as 8:14 PM on 12/25/2020.

### Adding constraint:

alter table customer

add constraint c\_pCode foreign key(c\_pCode) references product(pCode);





## Equi-Joins:

(1)

select o.oName

from owner o, shop s

where o.sNumber = s.sNumber;

SQL Commands

Food categori for burger and ...

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
select o.oName
from owner o, shop s
where o.sNumber = s.sNumber;
```

Results Explain Describe Saved SQL History

OWNAME
Dhrubo
Sharif
Anas

3 rows returned in 0.04 seconds [CSV Export](#)

Application Express 2.1.0.00.39

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Language: en-us

Type here to search

7:48 PM 12/23/2020

(2)

```
select p.pName
from customer c, product p
where p.pCode = c.c_pCode;
```

The screenshot shows the Oracle Database Express Edition SQL Commands window. The query entered is:

```
select p.pName  
from customer c, product p  
where p.pCode = c.c_pCode;
```

The results are displayed in a table with the following data:

PNAME
Burger
Burger
Sandwich
Pizza

4 rows returned in 0.00 seconds

Language: en-us

## Outer Joint:

```
select c.c_pCode, p.pName  
from customer c, product p  
where c.c_pCode (+)= p.pCode;
```

The screenshot shows the Oracle Database Express Edition SQL Commands window. The SQL command entered is:

```
select c.c_pCode, p.pName
from customer c, product p
where c.c_pCode (+) = p.pCode;
```

The results are displayed in a table with 5 rows:

C_PCODE	PNAME
300	Burger
301	Sandwich
302	Pizza
300	Burger
-	Cocacola

5 rows returned in 0.00 seconds. The window also shows the Oracle logo, navigation links (Home, Logout, Help), and the user SYSTEM.

### Self joint:

```
select distinct p.pName
from product p, product po
where p.pCode = 10*po.p_caCode;
```

The screenshot shows the Oracle Database Express Edition interface. The browser address bar displays the URL `127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::`. The page title is "ORACLE Database Express Edition". The user is logged in as "SYSTEM". The "SQL Commands" window is active, showing the following SQL query:

```
select distinct p.pName
from product p, product p2
where p.pCode = 10*p2.p_code;
```

The query has been executed, and the results are displayed in a table with the following data:

PNAME
Burger
Cocacola

Below the table, it states "2 rows returned in 0.00 seconds" and provides a "CSV Export" link. The footer of the application shows "Application Express 2.1.0.0.39" and "Copyright © 1999, 2005, Oracle. All rights reserved.".

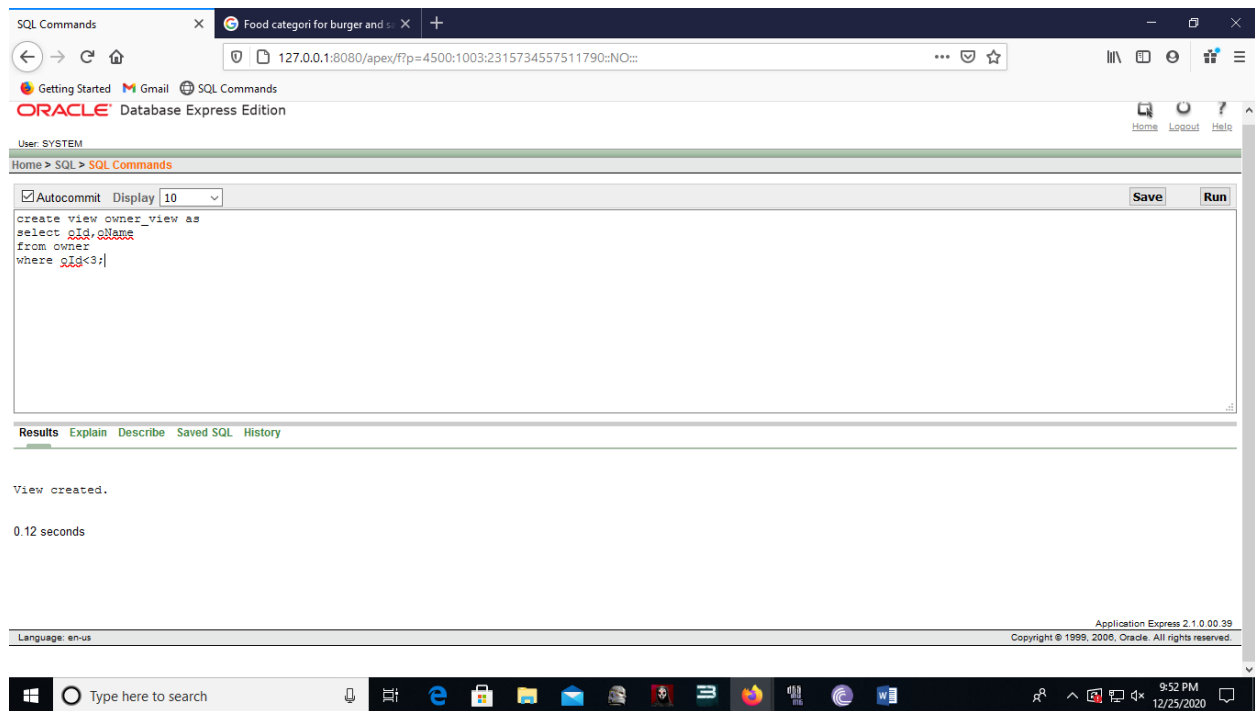
### Simple View:

create view owner\_view as

select old,oName

from owner

where old<3;



### Complex View:

```
create view owner_shop_view as  
select distinct o.oName, s.sName  
from owner o, shop s  
where o.sNumber = s.sNumber;
```

SQL Commands

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
create view owner_shop_view as
select distinct o.shop_id, s.shop_id
from owner o, shop s
where o.shop_id = s.shop_id;
```

Results Explain Describe Saved SQL History

View created.

0.00 seconds

Application Express 2.1.0.00.39  
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Type here to search

10:19 PM  
12/25/2020

## Data Insertion Screenshots:

SQL Commands

New Tab

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
insert into category values(30,'FastFood');
```

Results Explain Describe Saved SQL History

1 row(s) inserted.

0.04 seconds

Application Express 2.1.0.00.39  
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https://www.mozilla.org/en-US/firefox/central/

Type here to search

11:36 PM  
12/25/2020

SQL Commands x New Tab x +

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
insert into category values (31,'Drinks');
```

Results Explain Describe Saved SQL History

1 row(s) inserted.

0.00 seconds

Application Express 2.1.0.0.39  
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Language: en-us

Type here to search

11:39 PM 12/23/2020

SQL Commands x New Tab x +

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
insert into category values (32,'Spicy');
```

Results Explain Describe Saved SQL History

1 row(s) inserted.

0.00 seconds

Application Express 2.1.0.0.39  
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Language: en-us

Type here to search

11:40 PM 12/23/2020



SQL Commands x New Tab x +

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
insert into product values(300,'Burger',30);
```

Results Explain Describe Saved SQL History

1 row(s) inserted.

0.00 seconds

Full-screen Snip

Application Express 2.1.0.0.39  
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Language: en-us

Type here to search

11:46 PM 12/23/2020

SQL Commands x New Tab x +

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting Started Gmail SQL Commands

ORACLE Database Express Edition

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit Display 10 Save Run

```
insert into product values(302,'Pizza',30);
```

Results Explain Describe Saved SQL History

1 row(s) inserted.

0.00 seconds

Application Express 2.1.0.0.39  
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Language: en-us

Type here to search

11:47 PM 12/23/2020

The screenshot shows the Oracle Database Express Edition SQL Commands window. The browser address bar displays the URL `127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::`. The page title is "ORACLE Database Express Edition". The user is logged in as "SYSTEM". The SQL command entered is `insert into product values(301,200);`. The command is executed, and the results show "1 row(s) inserted." and "0.00 seconds". The status bar at the bottom indicates "Application Express 2.1.0.00.39" and "Copyright © 1999, 2005, Oracle. All rights reserved."

The screenshot shows the Oracle Database Express Edition SQL Commands window. The browser address bar displays the URL `127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::`. The page title is "ORACLE Database Express Edition". The user is logged in as "SYSTEM". The SQL command entered is `insert into product values(302,800);`. The command is executed, and the results show "1 row(s) inserted." and "0.00 seconds". The status bar at the bottom indicates "Application Express 2.1.0.00.39" and "Copyright © 1999, 2005, Oracle. All rights reserved."

## Sub Query:

(1)

select s\_pCode, pPrice

from product\_S

where pPrice = (select min(pPrice) from product\_S);

The screenshot shows the Oracle Database Express Edition SQL Commands window. The query entered is:

```
select s_pCode, pPrice
from product_S
where pPrice = (select min(pPrice) from product_S);
```

The results are displayed in a table with the following data:

S_PCODE	PPRICE
310	10

1 rows returned in 0.00 seconds

The window also shows the Oracle logo and the text "ORACLE Database Express Edition". The user is SYSTEM. The window title is "SQL Commands". The URL bar shows "127.0.0.1:8080/apex/?p=4500:1003:2315734557511790:NO::". The bottom status bar shows "Application Express 2.1.0.0.39" and "Copyright © 1999, 2005, Oracle. All rights reserved."

(2)

select s\_pCode, pPrice

from product\_S

where pPrice = (select max(pPrice) from product\_S);

The screenshot shows the Oracle Database Express Edition SQL Commands window. The query entered is:

```
select s_pCode, pPrice
from product_S
where pPrice = (select max(pPrice) from product_S);
```

The results show one row with the following data:

S_PCODE	PPRICE
302	800

1 rows returned in 0.06 seconds

The window also shows the 'Autocommit' checkbox checked and the 'Display' dropdown set to 10. The 'Run' button is visible next to the query editor.

(3)

select s\_pCode, pPrice

from product\_S

where pPrice = (select pPrice from product\_S where pPrice = 10);

The screenshot shows the Oracle Database Express Edition interface. The browser address bar displays the URL `127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::`. The page title is "ORACLE Database Express Edition". The user is logged in as "SYSTEM". The "SQL Commands" window is active, showing the following SQL query:

```
select s_pCode, pPrice
from product_S
where pPrice = (select pPrice from product_S where pPrice = 10);
```

The query has been executed, and the results are displayed in a table with the columns `S_PCODE` and `PPRICE`. The table contains one row with the values `310` and `10`.

S_PCODE	PPRICE
310	10

Below the table, it states "1 rows returned in 0.01 seconds" and provides a "CSV Export" link. The bottom of the window shows the Windows taskbar with the search bar and various application icons. The system clock indicates the time is 12:28 AM on 12/26/2020.

(4)

select old, oName

from owner

where sNumber = (select sNumber from shop where sNumber = 101);

SQL Commands

New Tab

127.0.0.1:8080/apex/f?p=4500:1003:2315734557511790::NO::

Getting StartedGmailSQL Commands

ORACLE Database Express Edition

HomeLogoutHelp

User: SYSTEM

Home > SQL > SQL Commands

☒ Autocommit

Display 10

SaveRun

```
select o_id, o_name
from owner
where s_number = (select s_number from shop where s_number = 101);
```

ResultsExplainDescribeSaved SQLHistory

OID	ORNAME
1	Dhrubo

1 rows returned in 0.00 secondsCSV Export

Application Express 2.1.0.00.39

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Windows

Type here to search

12:32 AM  
12/26/2020